DOCUMENT RESUME

ED 090 243 SP 007 989

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TITLE Teacher Awareness of Classroom Dyadic Interactions.
PUB DATE Apr 74
NOTE 20p.; Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, Illinois, April 1974)

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS *Classroom Communication; *Classroom Research; Interaction Process Analysis; Perception; *Teacher Behavior; Teachers; *Verbal Communication

ABSTRACT

Dyadic interactions between teachers and students were recorded in 30 classrooms with each classroom being observed for one day. At the end of the day teachers were told the number of contacts they had with individual students and were asked to estimate the percentages that were a) response opportunities, in which the child attempts to answer a question posed by the teacher; b) recitation and reading, in which the child makes an extended oral presentation; c) procedural contacts, in which the teacher-child interaction is concerned with classroom management; d) work contacts, in which the interaction concerns some form of work which the child has completed; or e) behavior contacts, in which the teacher disciplines the child or comments on his behavior in some other way. Teachers were also asked to estimate the percentage of each of the above categories which were engaged in with students of each sex. Data tabulations show that the subject teachers were unable to estimate accurately the percentage of contacts in each category, nor could they estimate the number of contacts with students of each sex. The one area in which subjects were more accurate was in their estimation of praise for nonacademic behavior, but this might be explained by the fact that only 8 percent of behavior contacts were praise for nonacademic behavior. (HMD/Author)

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TEACHER AWARENESS OF CLASSROOM DYADIC INTERACTIONS

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The analysis of factors operative in classroom interaction between teachers and pupils has been a long-standing concern of many educators. Toward this end, numerous systematic observation techniques have been developed to describe various aspects of the teaching-learning process (Simon & Boyer, 1967). One purpose for which these instruments have been used is to provide feedback to teachers regarding the type and frequency of their interactions with students. An assumption underlying this use of observation techniques is that teachers are unaware of certain aspects of their behavior in the classroom. As a results, both their intentions and their perceptions of what takes place in the classroom may differ significantly from what in fact occurs.

Despite the recognized importance of teachers' awareness of their own behavior, few investigators have systematically studied this question. Several authors, however, have included statements on teachers' self-awareness in the context of broader research efforts. Johnston (1968), for instance, in a study assessing the effectiveness of training student teachers in Interaction Analysis, found no significant relationship between the teachers' perceptions of the percentage of their indirect behaviors and those actually observed. Breyer, Calchera, and Cann (1971) also found that teachers instructed in the use of various behavior modification strategies were often unable to verbalize how they had performed during a given observation period. Similarly, Good and Brophy (1972) have noted that teachers involved in a study of classroom interaction were generally unaware of their differntial interaction patterns with certain members of the class. In their recent book, Good and Brophy (1973)

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have cited several other studies which indicate that teachers sometimes misinterpret their own behavior (Emmer, 1967) and have discrepant perceptions of their behavior from those of students (Ehman, 1970; Wolfson & Nash, 1968).

It is within the context of these issues of teacher awareness and intention that the present investigation was undertaken. The purpose of this study was to systematically assess, in greater detail than has previously been done, the extent to which teachers are aware of their dyadic interaction patterns with children in a normal classroom situation.

Method

Sample

Observations were carried out in 30 classrooms within eight schools. These eight schools represented six different school districts, three of which were affiliated with the Catholic Church. In all, six of the 30 classrooms were in parochial schools. The eight schools were all located in generally lower-middle socioeconomic areas. One school district (11 classrooms) contained approximately 20 percent Black children, while in the remaining districts (19 classrooms) Black children comprised less than one percent of the enrolled populations.

The classrooms represented ten first grades, eight second grades, and twelve third grades, and all were primarily traditional in structure and functioning. Of the 30 teachers, all were female except one. They ranged in teaching experience from one year to 42 years, with a mean of 8.3 years.

Instrumentation

The classroom observation technique used in this study was a simplified version of the Brophy and Good (1969) Teacher-Child Dyadic Interaction system. Brophy and Good's system provides a record of the interactions between a teacher and individual children in the classroom. This is opposed to the

more frequent practice of using the class as a whole as the unit of analysis.

In the modified system used in the present study, five types of dyadic interaction situations were coded: (1) Response opportunities, in which the child publicly attempts to answer a question posed by the teacher, or relates something of a self-reporting nature; (2) Recitation and reading, in which the child reads aloud, describes some experience or object, goes through arithmetic tables, or makes some other extended oral presentation; (3) Procedural contacts, in which the teacher-child interaction concerns permission to do something, access to supplies and equipment, or other procedural matters concerned with the child's individual needs or with classroom management; (4) Work-related contacts, in which the teacher-child interaction concerns seat-work, homework, or other written work completed by the child; (5) Behavior contacts, in which the teacher disciplines the child or makes individual comments concerning his classroom behavior.

Also recorded were: (1) the Quality of the child's response following a question; and (2) the Teacher's feedback reactions following a child's response. The quality of the child's response was coded as (a) correct, (b) part correct, (c) incorrect, or (d) no response. The teacher's feedback reactions were coded as either (a) terminal feedback or (b) sustaining feedback. Terminal feedback responses include praise, positive feedback, no feedback, negative feedback, criticism, gives answer, asks other, call out by another child, or process feedback, in which the teacher gives a child the cognitive or behavioral processes that he should have gone through to obtain a correct answer. Sustaining feedback refers to the teacher's repeating the question, rephrasing the question, or providing a clue to the child.

The modifications of Brophy and Good's original technique, reflected in the system described here, involved elimination of the coding categories

classifying the level of the question asked of the child, simplification of the response opportunity category to either permit or call out, elimination of the warning category in behavior contacts, and classification of teacher-child interactions only according to the sex of the child, rather than individual labeling. These changes were made to reduce the amount of time needed for observers to achieve an acceptable level of reliability, and because of the focus of this study. Such modifications have been justified by Brophy and Good (1969, p. 4) on the basis that different research questions may require slightly different coding approaches.

In addition to this instrument, a questionnaire was developed to record teacher estimations of the types of dyadic contacts undertaken during the period of observation. In general, these questions direct the teacher to estimate percentages of the total number of contacts that were of a specific type, or the percentage of a certain type of interaction that was directed toward either males or females. Questions were selected primarily to cover the most frequently coded categories of student-teacher interaction as outlined by Brophy and Good, or to examine behaviors coded less often, but which have been emphasized in educational theory. An example of the latter type of question was, "What percentage of all your contacts that involved behavior were followed by praise?" Interest in this particular category was related to the special significance afforded praise by behavior modification theorists.

Particular emphasis was given to sex differences within certain interaction categories because of recent research by the senior author which demonstrated a pervasive tendency for elementary school teachers to interact with males more than females. In this previous investigation, the author's subjective impression was that teachers were generally unaware of these differences.

Within several of the interaction categories, teachers were additionally

asked to state what they would consider to be optimal behavior. This question was included to assess differences between the patterns of interaction that were observed in the classroom and what the teachers thought was an optimal pattern of interaction. A list of the questions asked of teachers is presented in Table 1.

Insert Table 1 about here

Procedure

Two observers, experienced in the use of the Brophy and Good observation method, collected the classroom data for the present study. Prior to the beginning of observations, the observers coded a representative classroom situation for purposes of establishing inter-observer reliability. Reliability, or percent of agreement, was calculated by the ratio of exact agreements to the combined total of exact agreements, plus omissions, plus disargeements across all coding categories, as suggested by Brophy and Good (1969, p. 103). A reliability of .81 was obtained. Mid-way through the period of data collection, a subsequent reliability check revealed inter-observer agreement of .79.

Each classroom was observed for one school day, with data being collected only when the class was in session with the regular teacher. Lunch periods, recess, and special activities with an ancillary teacher were not included in observations. At the end of each day, the data were summarized and the percentages of types of contacts observed were calculated. Teachers were then asked to estimate the occurrence of the various dyadic interactions under investigation (See Table 1). Before each estimation, teachers were given a brief explanation of exactly what each interaction category did and did not include. For five of the items, teachers were asked to determine what they would consider the optimal classroom behavior to be within each of the relevant inter-

action categories. Finally, feedback was provided to teachers about what had actually been observed.

Results

The central purpose of the parent investigation was to assess teacher awareness of classroom dyadic interaction within a number of different behavioral categories, as well as differences in patterns of interaction involving males and females. Data relating to these questions are presented in Table 2 and 3.

Table 2 presents the means and standard deviations per hour of the frequencies of each type of interaction. So that future comparisions could be made to other classroom situations, all types of interactions categorized by sex were adjusted for unequal distributions of the sexes; that is, the means reported represent the frequency of a specific type of interactions assuming a 50-50 sex split for all classrooms. When estimating sex differences in frequency and of interactions, teachers were instructed to make their estimates based on a 50-50 sex split. Included in Table 3 are the frequencies of directional discrepancies between observations and teacher estimations of the types of interaction under investigation. For purposes of this analysis, discrepancies of greater than ten percentage points between observations and estimates were arbitrarily interpreted as meaningful. Discrepancies of less than ten percentage points were considered to be accurate teacher estimates of what had been observed. Also included in Table 3 are mean absolute value discrepancies for each of the coding categories analyzed. This figure provides an overall estimate of the accuracy of teacher estimates. Part 1 of Table 3 summarizes the data for teacher awareness of the different types of interactions observed, while Part 2 summarizes the data specific to teacher awareness of male-female differences.

Insert Table 2 about here

Inspection of the mean percentage discrepancies in Part 1 of Table 2 indicates that, in general, teachers had considerable difficulty in estimating the frequency of various types of interaction occurring in their classrooms. The average discrepancy between observations and estimates was 22.7 percent for all categories.

In terms of who initiated the teacher-child interactions observed, nearly two-thirds of the teachers thought that children had begun a greater percentage of the total interactions than they actually did. Even greater consistency was noted in the teachers' over-estimation of what percentage of all contacts involved children's behavior unrelated to academic work. Here all teachers except one felt that they had spent more time dealing with classroom behavior than was observed-- an overestimation of greater than 30 percent. Similarly, though to a somewhat lesser extent, teachers tended to overestimate the percentage of their total contacts which involved procedural matters. Almost two-thirds of the teachers overestimated the percentage of time this kind of interaction occurred. It is apparent that in the generally structured, task-oriented classrooms observed, the teachers consistently exaggerated the extent to which they were involved in non-task related activities of a behavioral or procedural nature.

Another area of interest within the general categories of observation involved the use of prasie. As indicated in Table 2, the greatest degree of awareness was evidenced by teachers in their estimates of what percentage of their non-academic behavioral contacts with students involved praise. About two-thirds of the teachers were quite accurate in their estimates of behavioral praise. This accuracy is undoubtedly a reflection of the fact that practically

no behavior praise was observed in these classrooms. There was an average of only eight percent of all behavior contacts in which the teacher praised an individual child. In contrast to this awareness of the use of behavioral praise, however, teachers substantially overestimated the use of praise across all types of dyadic contacts. Thus within the context of work contacts, response opportunities, reading and recitation responses, teachers thought they used considerable more praise than was observed.

The final type of contact reported in Part 1 of Table 2 involved the extent to which teachers provided sustained feedback to children having difficulty during a responses opportunity. Here the teachers tended to underestimate the percentage of time they "stayed with" a child to help him arrive at the correct answer. Half of the teachers estimated that they did this less than observations indicated.

Part 2 of Table 2 presents data relating to teachers' awareness of the percentage of various kinds of interactions afforded each of the sexes. From the mean percentage discrepancies reported, it can be seen that, in general, teachers were slighly more accurate in their estimates of these sex-related items than in the overall categories of Part 1. However, these items resulted in less consistent estimates from teachers than those of Part 1, as seen in the frequencies of directional discrepancies. It should be recognized that one would expect somewhat more accurate estimates regarding these sex-related items, since teachers could start with the assumption that the percentages would be evenly divided, and then adjust their estimates upward or downward for each category. This hypothetical reference point would not exist for the estimates of items in Part 1.

Surprisinly, while half of the teachers were aware of the percentage of total interactions given to males and females, a third of the teachers overestimated the percentage of all contacts that involved males. In other words,

a third of the teachers observed could not estimate to within ten percentage points, what proportion of their contacts were directed toward each of the sexes. This same tendency was noted in the percentage of child initiated contacts involving males, where nearly a third of the teachers estimated a larger percentage than was observed.

Within the categories of interaciton that related specifically to non-academic or non-task related activities, only slightly better than a third of the teachers were aware of their interactions with each sex. Moreover, within these categories, a third of the teachers overestimated the percentage of all behavior contacts directed toward females, while a third overestimated the percentage of all procedural contacts which involved males.

In the area of praise, there was little consistency demonstrated in teachers' estimates. Approximately a third of the teachers were aware of the percentage of praise that was afforded females, while about an equal number over and underestimated the observed percentages.

The only category within the framework of sex-related items were teachers demonstrated a moderate degree of awareness was in the percentage of response opportunities given to each sex. Two-thirds of the teachers accurately estimated this category of interaction, and the mean absoluate percentage discrepancy was relatively low.

Finally, from Part 2 of Table 2 it can be seen that approximately half of the teachers were aware of the percentage of questions answered correctly by both males and females, while almost half underestimated these percentages.

In addition to the question of teacher awareness, the present study was designed to investigate the extent to which teachers behave in accordance with what they consider to be optimal behavior. Stated another way, what is the discrepancy between what teachers do and what they would like to do?

Table 3 presents data relating to discrepancies between observations and

what teachers would consider optimal within several of the dyadic interaction categories. Again, both mean absolute value discrepancies and the frequencies of directional discrepancies are reported. By relating these results to the data on teacher awareness, certain trends in teacher behavior can be perceived, and lend an insight into the importance of teacher awareness. It should be noted that, in the collection of these data, teachers were asked what they would consider to be the optimal behavior within each of the five categories. Thus the perceptions recorded may not be synonymous with the intentions of these particular teachers. One might hope that teachers' notions of optimal behavior and their intentions are similar, but this is not certain.

Insert Table 3 about here

The first category of interest concerned the percentage of all contacts initiated by children. As noted previously, approximately two-thirds of the teachers overestimated the percentage of all contacts which were child-initiated. From Table 3 it can be seen that nearly all teachers thought that more interactions should be initiated by children. It is apparent that teachers were generally unaware of the origin of most interactions, and they thought they were structuring their classrooms more in line with what they considered optimal than observations indicated.

An additional area in which teachers demonstrated a considerable lack of awareness was in the percentage of sustained feedback provided to children experiencing difficulty during a response opportunity. In this case teachers generally perceived that they provided less sustained feedback than actually occurred. However, from the data in Table 3 it can be seen that over two-thirds of the teachers felt that they should provided even more sustained feedback than was observed. The implication here is that, teachers were

actually behaving more in accordance with what they considered to be desirable behavior than they thought, they were still not at the level considered optimal.

In one other area, however, a very different tendency was revealed. As discussed previously, teachers were generally aware of the fact that they very rarely praised the non-task related behavior of children. However, as indicated in Table 3, all teachers but one thought that more praise should be used -- over 50 percent more. Thus, despite apparent awareness of their behavior, the teachers did not modify the nature of their responses to children's behavior toward what they thought was optimal.

Finally, while only about half of the teachers were aware of what percentage of questions asked in the classroom children answered correctly, the last two items in Table 3 indicate that nearly a third of the teachers thought that both males and females should actually get fewer answers correct. Table 2 reveals that both males and females were observed responding correctly to approximately 80 percent of the questions asked. Thus nearly a third of the teachers in these observations felt that children should be getting fewer than 80 percent of the questions asked correct.

Discussions

The results of the present study provide substantial empirical support for the position that teachers are unaware of certain patterns of classroom interaction. Significant discrepancies between observed behaviors and teacher estimations were found between patterns of teacher-child interaction and what teachers optimal patterns of such behavior.

Among the general types of interaction recorded, a lack of teacher awareness was evidenced in nearly all areas. These included the percentage of contacts initiated by children, the use of sustained feedback, and the amount of time spent dealing with non-task related classroom behavioral and

procedural matters. The only area in which teachers did demonstrate substantial awareness was in their use of praise for non-academic behavior. This finding is undoubtedly related to the fact that almost no behavior praise was observed. However, this awareness did not carry over to the use of praise across all categories of interaction.

The awareness of teachers concerning differences in patterns of interaction with each of the sexes was only slightly greater than for the general categories. One would expect his moderate improvement in estimates on the basis that the realistic range of sex-related contact ratios should be considerably smaller than for the more general categories. Only in the area of the percentage of response opportunities afforded each of the sexes were teachers generally accurate in their estimations. Awareness in this area could be related to a conscious concern on the teachers' part to provide equal response opportunities to males and females. Since this type of interaction is under the control of the teacher somewhat more easily than others, there may be a concerted effort made in this regard to maintain equality, thus heightening teachers' awareness of their attention to each sex.

In light of this and other corroborative studies, the question which arises is why are teachers unaware of so many teacher-child patterns of interaction. Good and Brophy (1973) have suggested three possible reasons: (1) there is so much activity going on in the classroom that it is difficult for a teacher to be conscious of it all; (2) teacher training institutions have not provided teachers with the conceptual framework to process and interpret this kind of information; and (3) teachers have no means of receiving consistent feedback from an objective source regarding what is happening in the classroom.

The present investigation supports these explanations. Table 2 reveals that an average of 94 interactions per hour were observed between a teacher

and individual children. Thus the classrooms observed were busy places, and teachers were involved in a great deal of activity. Support for the other two reasons outlined by Good and Brophy came from the comments and reactions of many of the teachers regarding the questions asked and the feedback provided. It was apparent to the observers that many of the teachers were not "tuned in" to the kinds of classroom process variables being investigated. Numerous teachers remarked that they had never really thought about the types of things reflected in the questions asked. These indications seem to suggest an inadequacy on the part of training programs to sensitize teachers to this kind of information. Additionally, several teachers remarked about the usefulness of the feedback provide following observations, even though there was no discussion of the meaning of what had been observed and there were to be no follow-up observations. A frequent comment was that periodic feedback of this sort would be particulary valuable.

It seems reasonable to assume that unless teachers become aware of the nature of the interactions operative in their classrooms, efforts to improve teaching practices and enhance classroom functioning will have limited success. While little can be done about the fact that so much activity goes on in the classroom, the teacher's ability to interpret this activity could be modified by focusing on the other two areas of concern: (1) insufficient training in the conceptualization and processing of interaction variables; and (2) lack of classroom feedback procedures. Both in the program of teacher training and in subsequent periodic workshops, teachers could be provided with the conceptual framework to more fully understand the types of interaction occurring in the classroom and the effects of this interaction on things such as student achievement and adjustment. The provision of feedback to teachers about what is actually observed in the classroom could be accomplished through

the use of psychologists or other consulting school personnel, trained in the use and interpretation of behavioral observation techniques. A more broad-based approach would be to involve teachers themselves in the process of behavioral assessment, as has been suggested by Good and Brophy (1973). Such involvement would assume training in the systematic observation and interpretation of classroom behavior, enabling teachers to work together as sources of objective feedback and to monitor their own behavior within a conceptual framework.

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Table 1

Estimations Obtained From Teachers

1.	Estimate the number of times you talked to individual students or students talked to you today.
2.	You had ___ contacts with individual students today. What percentage of those contacts were with boys?
* 3.	You had ___ contacts with individual students today. What percentage of those contacts were initiated by children?
4.	You had ___ contacts that were initiated by students. What percentage were initiated by boys?
5.	You had ___ contacts with individual students today. What percentage of those contacts were directed toward behavior as opposed to academic work or classroom procedural matters?
6.	You had ___ behavioral contacts today. What percentage of those contacts do you think involved girls?
7.	You had ___ contacts with individual students today. After what percentage of those contacts did you praise the student?
8.	You had ___ contacts that were followed by praise. What percentage of those contacts involved girls?
* 9.	You had ___ contacts that involved behavior. What percentage of those contacts were followed by praise?
10.	You had ___ response opportunity contacts today. What percentage of those contacts were given to boys?
* 11.	You had ___ response opportunity contacts. When a child got an answer wrong in this kind of situation, what percentage of the time did you give him another chance or help him get the answer, as opposed to telling him the answer was wrong or going on to another child?
* 12.	You had ___ response opportunity contacts for boys. What percentage of the questions did boys answer correctly or partially correctly?
* 13.	You had ___ response opportunity contacts for girls. What percentage of the questions did girls answer correctly or partially correctly?
14.	You had ___ total contacts with students today. What percentage of those contacts involved procedural matters?
15.	You had ___ procedural contacts. What percentage involved boys?

*Note: Teacher perceptions of optimal behavior also obtained for these items.

TABLE 2

Means Frequency of all Observed Dyadic Interaction

Type of Interactions	Mean	S.D.
Total Dyadic Interaction/per hour	93.8	21.3
*Male Interaction/per hour	48.9	14.0
Child Initiated Contacts/per hour	22.0	8.7
*Male Child Initiated Contacts/per hour	10.1	3.8
Behavior Contacts/per hour	12.8	10.0
*Female Behavior Contacts/per hour	4.1	4.2
Total Praise/per hour	8.5	7.0
*Praise for Females/per hour	4.0	3.2
Praise for Behavior/per hour	.9	1.8
*Male Response Opportunities/per hour	18.6	8.5
Sustained Feedback/per hour	4.1	3.5
*Male Correct Responses/per hour	15.8	7.1
*Female Correct Responses/per hour	13.0	4.9
Procedure Contacts/per hour	19.3	7.1
*Male Procedures/per hour	9.9	3.7

* All sex specific frequencies corrected for unequal distribution of sexes. Frequencies reflect a 50-50 sex split.

Table 3

Directional and Absolute Value Discrepancies Between Observations and Teacher Estimations

Contact Ratios	Frequency of Directional Discrepancies[a] Low	Accurate	High	Mean % Discrepancy
Part 1				
Child Initiated Contacts/Total Contacts	1	11	18	21.7
Behavior Contacts/Total Contacts	0	1	29	32.6
Procedure Contacts/Total Contacts	1	11	18	24.2
Behavior Praise/Behavior Contacts	2	21	7	7.6
Praise/Total Contacts	1	7	22	26.4
Sustained Feedback/Incorrect, Part Correct, No Response (Respnse Opport.)	15	7	8	23.9
Part 2				
Male Contacts/Total Contacts	5	15	10	10.9
Male Child Initiated Contacts/Child Initiated Contacts	6	16	8	12.8
Female Behavior Contacts/Behavior Contacts	7	13	10	13.0
Female Praise/ Praise	10	12	8	15.0
Male Procedure Contacts/ Procedure Contacts	7	11	12	13.8
Male Response Opportunities/Response Opportunities	4	20	6	7.0
Male Correct, Part Correct/ Male Response Opportunities	13	14	3	10.0
Female Correct, Part Correct/ Female Response Opportunities	14	12	4	12.7

[a] Note: Low= teacher estimate greater than 10% below observation; Accurate= teacher estimate less than ± 10% from observation; High= teacher estimate greater than 10% above observation.

Table 4

Directional and Absolute Value Discrepancies Between Observations and Optimals

Contact Ratios	Frequency of Directional Discrepancies[a] Low	No Disc.	High	Mean % Discrepancy
Child Initiated Contacts/Total Contacts	0	2	27	32.1
Sustained Feedback/Incorrect, Part Correct, No Response (Response Opport.)	4	4	21	29.9
Behavior Praise/Behavior Contacts	0	1	28	50.6
Male Correct, Part Correct/Male Response Opportunities	8	17	2	11.4
Female Correct, Part Correct/Female Response Opportunities	8	16	3	11.0

[a]Note: Low= optimal greater than 10% below observation;
No Discrepancy= optimal less than ± 10% from observation;
High= optimal greater than 10% above observation.